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Open Geospatial Consortium

OGC Web Services: Integrating Geospatial Services on the Web (Why WMS for NASA)

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OGC Background

- **Open Geospatial Consortium (OGC)**
  - Not-for-profit, international voluntary consensus standards organization
    - Incorporated in US, UK, Australia
  - 270+ industry, government, and university members
  - Class A Liaison of ISO TC 211, TC 204 and CEN TC 287
  - Founded in 1994

OGC Mission

Our core mission is to deliver interface specifications that are openly available for global use.

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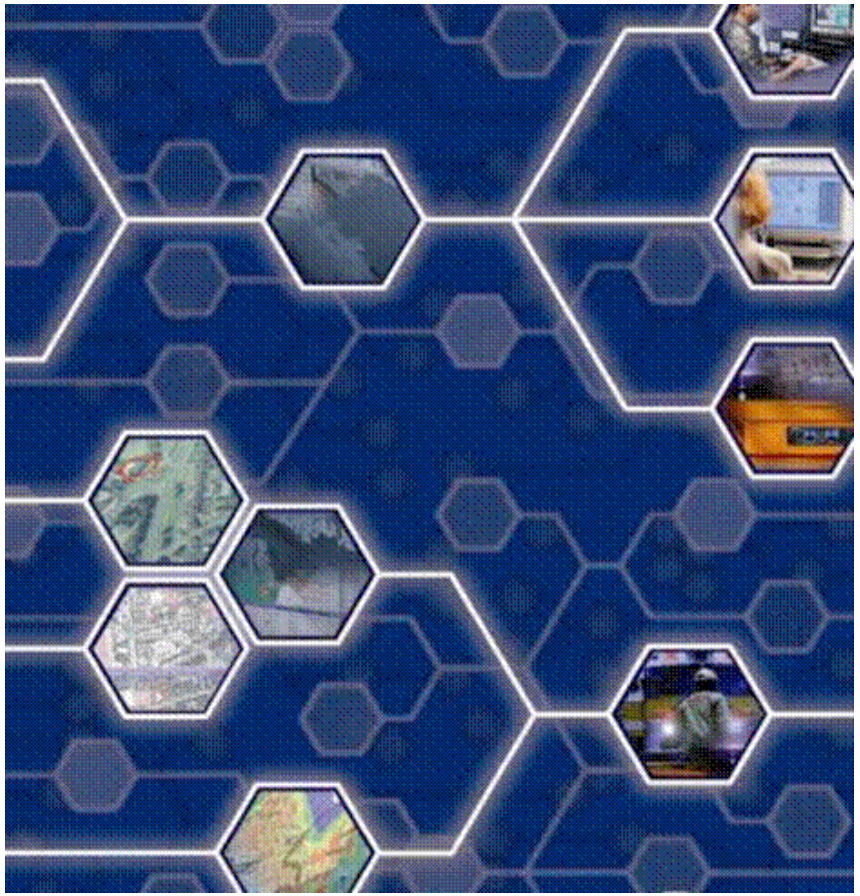
OGC Vision

A world in which everyone benefits from geographic information and services made available across any network, application, or platform.



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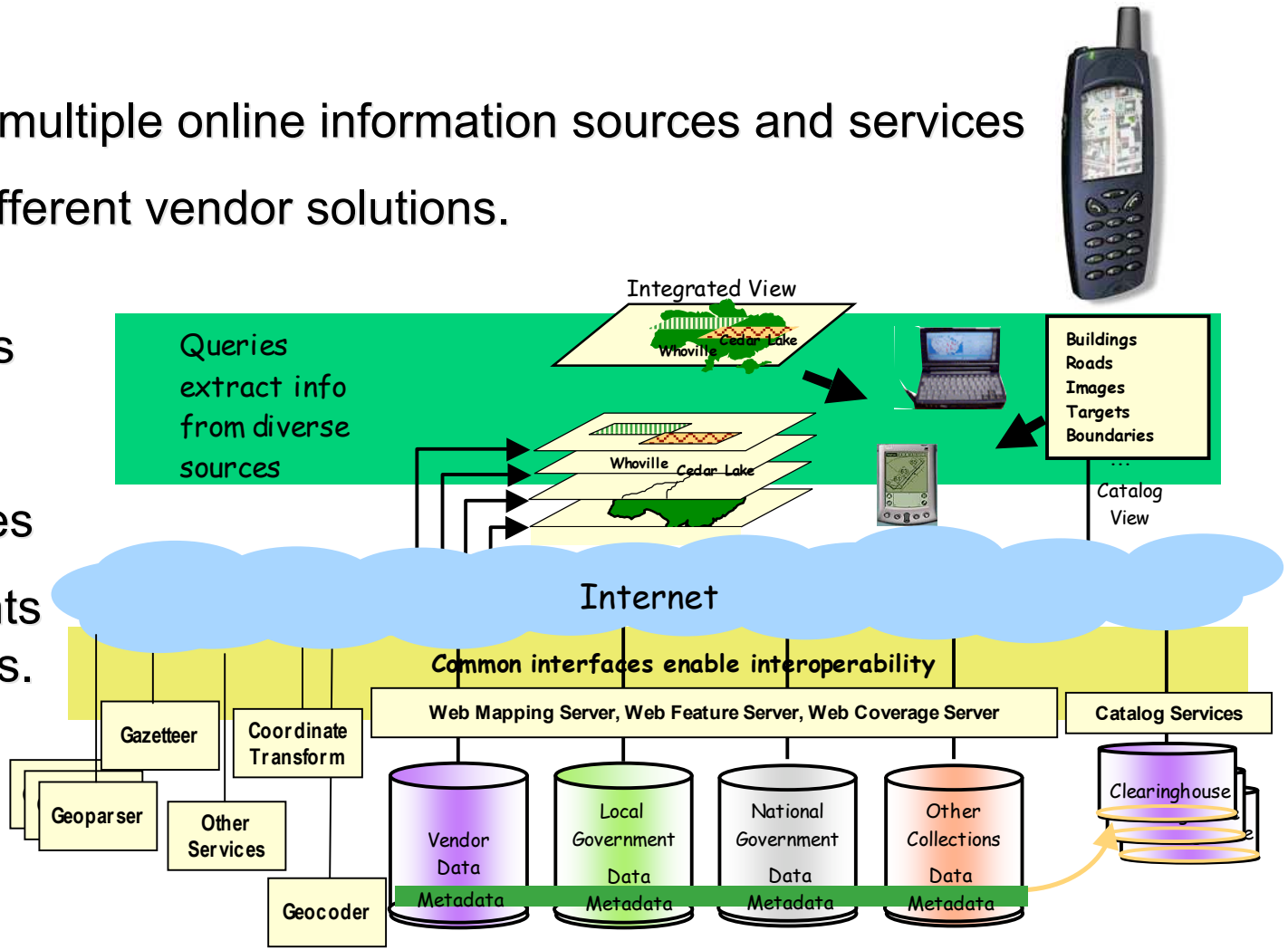
Better Decisions Via Interoperable Web Services

- Easier access to multiple online information sources and services
- Use and reuse different vendor solutions.
- Reduce deployment costs by reusing information from other communities
- Meet requirements for Citizen access.
- Foundation for interoperable service networks



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NASA Needs

- NASA Internal and External
  - Map background display
    - Georegistration is required
    - Automated analysis is not required
  - Data suitability analysis
    - Cloud cover
    - Resolution adequate for use
- Public Use of NASA data
  - Low band width
  - Ease of use

Why Open GIS ® WMS?

- Industry open consensus standard
  - Not dominated by any one vendor, but supported by all
    - ESRI, Intergraph, Map Info, Ionic, Open Source, Shareware
  - Promotes competition in the market place
  - Allows providers to choose their own software and still participate
  - Does not perturb existing systems – just add an interface
- Months away from becoming IS 19136:2005
  - Editor for ISO 19136 was provided by NASA

Why Open GIS ® WMS?, Continued

- Allows integration of NASA data into hundreds of applications around the world with nothing more than insertion of a URL by the client
  - Canada, Australia, New Zealand, UK, German states, etc.
  - U.S. DHS Architecture
  - U.S.G.S. The National Map and Geospatial One-Stop
- NASA Earth-Sun Gateway uses it for external access to and publishing of NASA data
  - http://esg.gsfc.nasa.gov/

NASA Sites

- NASA Earth-Sun Gateway
  - http://esg.gsfc.nasa.gov
- NASA / GMU AVIRIS Data Server: http://viewer.digitalearth.gov/viewer.cgi?addserver=25&service=View+Layer+Menu&context=world_topo_0_1_2.xml&fullcontrol=0&config=&expand=100
- Tropical Rain Forest Information Center
  - GetCapabilities URL prefix: http://trfic.jpl.nasa.gov/wmt/de.pl
- GSFC Distributed Active Archive Center Map Server
  - GetCapabilities URL prefix: http://eosdata.gsfc.nasa.gov/daac-bin/wmtdods

NASA Sites, Continued

- PO-DAAC-ESIP Map Server
- Version: 1.1.1 (10101)
  - GetCapabilities URL prefix: http://podaac-esip.jpl.nasa.gov/cgi-bin/esip/de.pl
- WMS Global Mosaic (JPL World Map Service)
- Version: 1.1.1 (10101)
  - GetCapabilities URL prefix: http://wms.jpl.nasa.gov/wms.cgi
- Lucian Plesea <Lucian.Plesea@jpl.nasa.gov>
-
- The GLOBE Program Visualization Server
- Version: 1.1.1 (10101)
  - GetCapabilities URL prefix: http://globe.digitalearth.gov/viz-bin/wmt.cgi

OGC Web Services Family

- Web Map Service
- Web Coverage Service
  - EOSDIS access prototyped in OWS –2 and now developed into production release code for Goddard and EDC DAACs
- Styled Layer Descriptor
- Web Feature Service
- Catalog Service – Web

OGC Web Services - 1

Open GIS ® Catalog Services	2.0	2004-08-02	Defines a common interface that enables diverse but conformant applications to perform discovery, browse and query operations against distributed and potentially heterogeneous catalog servers.
Open GIS ® Coordinate Transformation Services	1.0	2001-01-	12 Provides interfaces for general positioning, coordinate systems, and coordinate transformations.
Open GIS ® Filter Encoding	1.1	2005-05-03	This document defines an XML encoding for filter expressions based on the BNF definition of the OpenGIS Common Catalog Query Language as described in the OpenGIS Catalog Interface Implementation Specification, Version 1.0 [2].
Open GIS ® Geography Markup Language	3.1.1	2005-05-03	The Geography Markup Language (GML) is an XML encoding for the transport and storage of geographic information, including both the geometry and properties of geographic features.

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OGC Web Services - 2

Open GIS ® GO-1 Application Objects (AOS)	1.0.0	2005-05-04	The GO-1 Application Objects specification defines a set of core packages that support a small set of Geometries, a basic set of renderable Graphics that correspond to those Geometries, 2D device abstractions (displays, mouse, keyboard, etc.), and supporting classes. Implementation of these APIs will support the needs of many users of geospatial and graphic information.
Open GIS ® Grid Coverages (GC)	1.0	2001-01-12	This specification was designed to promote interoperability between software implementations by data vendors and software vendors providing grid analysis and processing capabilities.
Open GIS ® OGC Web Services Common Specification (Common)	1.0	2005-05-03	This document specifies many of the aspects that are, or should be, common to all or multiple OWS interface Implementation Specifications. Those specifications currently include the Web Map Service (WMS), Web Feature Service (WFS), and Web Coverage Service (WCS).

OGC Web Services - 3

Open GIS ® Simple Features - SQL (SFS)	1.1	1999-05-05	The Simple Feature Specification application programming interfaces (APIs) provide for publishing, storage, access, and simple operations on Simple Features (point, line, polygon, multi-point, etc).
Open GIS ® Styled Layer Descriptor (SLD)	1.0	2002-08-19	The SLD is an encoding for how the Web Map Server (WMS 1.0 & 1.1 & 1.3) specification can be extended to allow user-defined symbolization of feature data.
Open GIS ® Web Coverage Service (WCS)	1.0	2003-10-16	Extends the Web Map Server (WMS) interface to allow access to geospatial "coverages" that represent values or properties of geographic locations, rather than WMS generated maps (pictures).
Open GIS ® Web Feature Service (WFS)	1.1	2005-05-03	The OGC Web Feature Service (WFS) interface is a collection of operations (implemented as messages carried over HTTP) for retrieving and manipulating geographic features. An implementation of the OGC WFS IS allows a client to retrieve and update geospatial data from one or more Web Feature Services.

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Open GIS ® Web Map Context Documents (WMC)	1.1	2005-05-03	This document is a companion specification to the OGC Web Map Service Interface Implementation Specification The present Context specification states how a specific grouping of one or more maps from one or more map servers can be described in a portable, platform-independent format for storage in a repository or for transmission between clients.
Open GIS ® Web Map Service (WMS)	1.3	2004-08-02	Provides three operations protocols (GetCapabilities, GetMap, and GetFeatureInfo) in support of the creation and display of registered and superimposed map-like views of information that come simultaneously from multiple sources that are both remote and heterogeneous.
Open GIS ® Reference Model (ORM)	0.1.2	2003-03-04	The ORM describes a framework for the ongoing work of the OpenGIS Consortium and our specifications and implementing interoperable solutions and applications for geospatial services, data, and applications.

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Summary

- NASA has internal and external requirements to ‘publish’ data in easy to use, interoperable methods
- Open GIS ® WMS is:
  - Free to anybody in the world who wants to use the specification
  - Broad industry support
    - Vendors and open source, shareware
  - Used widely around the world
    - Means NASA data can be easily integrated into hundreds of systems by publishing it via WMS
- Open Geospatial Consortium brings:
  - Stable, respected organization to the table
  - More specifications for future consideration

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